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## Acute gross sterile pyuria after oral ciprofloxacin treatment of urinary tract infection

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### ABSTRACT

The sterile pyuria is an interesting problem in urology. Acute gross sterile pyuria is not a common clinical problem and is difficult to make a correct diagnosis. Here, the authors reported a case of acute gross sterile pyuria after oral ciprofloxacin treatment of urinary tract infection. The patient developed problem after complete course of 7-day acute upper urinary tract treatment. The patient was observed with cloudy whitish urine that had never seen before. The urinalysis showed sterile pyuria. This case was treated by conservative method and the problem was resolved within 7 days.

## 1. Introduction

Abnormal urination is usually problematic in clinical practice. Existence of white blood cell in urine in excessive amount is considered a problem. The term, pyuria, is used for describing this condition<sup>[1,2]</sup>. Generally, pyuria is associated with clinical problems especially for urinary tract infections. Pyuria is an important condition that general practitioner has to effectively deal. As note, the urinary tract infection is the main cause of pyuria. In general practice, pyuria might be seen in either male or female patients. In addition, the pyuria might be microscopic or macroscopic. In male, the overt pyuria is a common problem and this is the classical presentation of the sexually transmitted diseases (especially for gonorrhea). In female, the pyuria is also an important finding. The problem of urinary tract infection in the elderly female is often seen and required good early diagnosis and management. However,

pyuria can be sometimes seen without any identified pathogen and this condition is called sterile pyuria<sup>[3,4]</sup>. The sterile pyuria is an interesting problem in urology. Acute gross sterile pyuria is not a common clinical problem and is difficult to make a correct diagnosis. Here, the authors reported a case of acute gross sterile pyuria after oral ciprofloxacin treatment of urinary tract infection.

## 2. Case report

The patient is a 68-year-old female consulted to the physician with the problem of unexplained abnormal urine. This case had the problem of acute sterile pyuria. From history taking, the patient had just got the problem on the day of visit. The patient had just got the problem of acute upper urinary tract infection in the past week. One week before, the patient developed acute febrile illness, painful urination and flank pain. Her urine gross appearance was clear but the urinalysis showed white blood count 100–200/high power field and bacteria 3+. For this time, the urine culture showed *Escherichia coli* organism. She was treated by oral ciprofloxacin (1 500 mg/day). She was given high dosage of ciprofloxacin before she had underlying diabetes mellitus. The patient got improved and there was no fever since the third day

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after starting ciprofloxacin treatment. On the 1 week follow-up, there was a new problem. The patient observed cloudy whitish urine that had never seen before. She said her urine look like white soy milk. The patient developed problem after complete course of 7-day acute pyelonephritis treatment. The urinalysis showed white blood count > 300/high power field but no bacteria. Since there was no fever and pain, the physician in charge got doubtfulness on the finding so consulted to the expert. For this time, the urine culture showed no organism. Sterile pyuria was finally diagnosed. The adverse effect to antibiotic, ciprofloxacin was documented. This case was treated by conservative method and the problem was resolved within 7 days.

### 3. Discussion

Acute urinary tract infections such as acute urinary cystitis and acute pyelonephritis are common problem in daily clinical practice<sup>[1,2]</sup>. The problem is more common in elderly female cases. Dysuria, fever and pain can be the leading clinical features. The urinalysis is the useful laboratory for diagnosis<sup>[1,2]</sup>. Finding of bacteriuria and pyuria is the important finding confirming the clinical features. The urine culture can help identify pathogen. For management, antibiotic treatment is indicated. However, in some cases, there is no pathogen and the bacterial infection can be ruled out. The condition of sterile pyuria is usually a challenge in clinical management<sup>[3,4]</sup>. The problem can be due to several conditions such as tuberculosis, cancer and inflammation.

In the present case, the acute onset of acute sterile pyuria without any fever, pain or dysuria is a big challenge. The acute condition implies low possibility of chronic condition such as tuberculosis and cancer. The relationship between occurrence of problem and ciprofloxacin treatment is the clue for first diagnosis. The confirmation of unexplained numerous white blood cells without identified pathogen can be helpful in diagnosis nature of sterile pyuria. Focusing on adverse reaction of drug, some antibiotics are reported for induction of sterile pyuria.

The present case was ciprofloxacin induced acute sterile pyuria. There are some previous reports confirming the ciprofloxacin can induce acute interstitial nephritis which can be the cause of acute sterile pyuria<sup>[5,6]</sup>. For the treatment, the conservative treatment was proved useful<sup>[7,8]</sup>. Some reports mentioned for the usefulness of steroid therapy<sup>[7,8]</sup>. The early diagnosis of sterile pyuria was very important. Missed diagnosis can result in overuse of antibiotic and if it is the case of antibiotic induced sterile pyuria, more complication can be expected.

As noted, the case of ciprofloxacin induced pyuria required good history taking and concern for early diagnosis. The kidney injury induced by ciprofloxacin has to be kept in mind of any practitioners. Some patients might have risk for repeated urinary tract infection and the use of ciprofloxacin for management might pose risk. The good example is the elderly female with underlying diabetes mellitus. The example of ciprofloxacin induced kidney injury and pyuria can be seen in the recent report by Joob and Wiwanitkit<sup>[9]</sup>. The allergic reaction is presently proposed as the underlying pathophysiological process. Nasr *et al.* said that “acute tubular injury, a dose-dependent process, occurs due to direct toxicity on tubular cells<sup>[10]</sup>” and concluded that “acute interstitial nephritis characterized by interstitial inflammation and tubulitis develops from drugs that incite an allergic reaction<sup>[10]</sup>.” In fact, not only ciprofloxacin but also other drugs (such as sulfadiazine, indinavir, methotrexate) can cause this problem.

### Conflict of interest statement

The authors report no conflict of interest.

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